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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/869,985	07/09/2001	Kenneth L. Riley	GJH-0006	4473

7590

06/10/2003

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EXAMINER

ARNOLD JR, JAMES

ART UNIT	PAPER NUMBER
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1764

DATE MAILED: 06/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/869,985

Applicant(s)

RILEY ET AL.

Examiner

James Arnold, Jr.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 April 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 8.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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DETAILED ACTION

Response to Amendment

Applicant has overcome the 35 USC 112 rejections cited in paper no. 5.

Specification

This application does not contain an abstract of the disclosure as required by 37 CFR 1.72(b). An abstract on a separate sheet is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1, 2, and 4-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sawyer (ep-0 419 266) in view of George A. Olah, Hydrocarbon Chemistry, 1995.

The Sawyer reference discloses a process for producing a hydrocrackate having a relatively low sulfur and nitrogen content. Page 2 lines 4-6. The reference discloses reacting a

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feed stream in the presence of hydrogen treat gas. Page 3 line 22 and Page 7 lines 53-54. The reference discloses utilizing a catalyst bed comprised of a bulk multimetallic comprised of at least one Group VIII non-noble metals and at least two Group VIB noble metals. Page 4, lines 19-30. The reference discloses a process wherein a Group VIII non-noble metal is selected from Ni and Co and the Group VIB metals are selected from Mo and W. Page 4, lines 19-30. The reference discloses a process wherein the Group VIII non-noble metal is nickel. Page 4, lines 19-30. The reference discloses a process whereby a feedstock is hydrotreated to produce an effluent that is passed into a separation zone. Page 2 lines 24-32, Page 5, lines 40-48.

The Sawyer reference does not disclose a process for producing a hydrocrackate utilizing two or more catalyst beds composed of an upstream and downstream catalyst bed. The reference does not disclose a process wherein the ratio of Group VIB metals to Group VIII non-noble metals is about 10:1 to about 1:10. The reference does not disclose the use of a hydrocracking catalyst whose single reaction stage is operated at a temperature equivalent to about 300 to 450 C and hydrogen pressure equivalent to the range of about 85 to 200 bar. The reference does not disclose a process wherein two Group VIB metals are present as Mo and W and the ratio of Mo to W is about 9:1 to about 1:9. The reference does not disclose a process wherein the bulk multimetallic catalyst is a trimetallic catalyst represented by the formula, $(X)_b(Mo)_c(W)_dO_z$, wherein X is a group VIII non-noble metal, the molar ratio of $b:(c+d)$ is 0.5/1 to 3/1. The reference does not discloses a process wherein the bulk multimetallic catalyst is amorphous and has an X-ray diffraction pattern showing crystalline peaks at $d=2.53$ Angstroms and $d=1.70$ Angstroms. The reference does not disclose a process whereby the effluent from the hydrotreating stage is subsequently hydrocracked. The reference does not disclose a process

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wherein the bulk multimetalllic is represented by the formula, $(X)_b(Mo)_c(W)_dO_z$, and wherein the molar ratio of b: (c+d) is 0.5/1 to 3/1, preferably 0.75/1 to 1.5/1, more preferably 0.75/1 to 1.25/1. The reference does not disclose a process wherein the molar ratio of c:d is preferably $>0.01/1$, more preferably $>0.1/1$, still more preferably 1/10 to 10/1, still more preferably 1/3 to 3/1, most preferably substantially equimolar amounts of Mo and W, e.g., 2/3 to 3/2; and $z = [2b+6(c + d)]/2$.

The Olah reference discloses the use of a hydrocracking catalyst whose single reaction stage is operated at a temperature equivalent to about 300 to 450 C and hydrogen pressure equivalent to the range of about 85 to 200 bar. See page 30.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a process for producing a hydrocrackate utilizing two or more catalyst beds composed of an upstream and downstream catalyst bed because both catalyst beds are used for the same purpose of desulfurization and denitrification of the hydrocarbons. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a process wherein the ratio of Group VIB metals to Group VIII non-noble metals is about 10:1 to about 1:10 because the Group VIB metals and Group VIII non-noble metals are essential parts of the catalyst and it would be appropriate to use them in any combination effective for hydrotreating. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a hydrocracking catalyst whose single reaction stage is operated at a temperature equivalent to about 300 to 450 C and hydrogen pressure equivalent to the range of about 85 to 200 bar because these are standard conditions for hydrocracking. It would have been obvious to one having ordinary skill in the art at the time the invention was

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made to utilize a process wherein the bulk multimetallic catalyst is a trimetallic catalyst represented by the formula, $(X)_b(Mo)_c(W)_dO_z$, wherein X is a group VIII non-noble metal, the molar ratio of $b:(c+d)$ is 0.5/1 to 3/1 because the combination of X, W, and Mo are disclosed by the Sawyer reference and this combination can be supported on an inorganic oxide and because all the constituent components are disclosed by the reference and it would be appropriate to use them in any combination effective for hydrotreating. Furthermore, the Sawyer reference discloses the use of NiO and MoO_3 as hydrotreating catalysts. See Sawyer page 6, lines 15-25. It would have been obvious to one having ordinary skill in the art at the time the invention was made wherein the bulk multimetallic catalyst is amorphous and has a unique X-ray diffraction pattern showing crystalline peaks at $d=2.53$ Angstroms and $d=1.70$ Angstroms because diffraction peaks represent the characteristics of the reacted metal components. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a process whereby the effluent from the hydrotreating stage is subsequently hydrocracked because subsequent hydrocracking is utilized to further remove nitrogen and sulfur from the hydrocarbon effluent. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a process with a bulk multimetallic, $(X)_b(Mo)_c(W)_dO_z$, where the molar ratio of $b:(c+d)$ is 0.5/1 to 3/1, preferably 0.75/1 to 1.5/1, more preferably 0.75/1 to 1.25/1, and to utilize a process wherein the molar ratio of $c:d$ is preferably $>0.01/1$, more preferably $>0.1/1$, still more preferably 1/10 to 10/1, still more preferably 1/3 to 3/1, most preferably substantially equimolar amounts of Mo and W, e.g., 2/3 to 3/2; and $z = [2b+6(c+d)]/2$ because all the constituent components are disclosed by the reference and it would be appropriate to use them in any combination effective for hydrotreating.

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Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sawyer (ep-0 419 266) and George A. Olah, Hydrocarbon Chemistry, 1995 as applied to claim 1 above, and further in view of Velenyi (USPN 4,808,563).

The Velenyi reference discloses a molar ratio equivalent to the range of about 9:1 to about 1:9 for Mo and W. See abstract.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a process wherein two Group VIB metals are present as Mo and W and the ratio of Mo to W is about 9:1 to about 1:9 because the Group VIB metals, Mo, and W are essential parts of the catalyst and it would be appropriate to use them in any combination effective for hydrotreating.

Response to Arguments

Applicant's arguments have been fully considered but are deemed unpersuasive. Applicant asserts that none of the cited references describe the use of the inventive Ni-Mo-W catalyst combination. The individual components of the catalyst combination, however, are described by the cited references as being suitable for hydrotreating. See Sawyer, page 4, lines 19-27 and Velenyi, Abstract. Therefore, combining the individual components, known for their use and effectiveness in hydrotreating, to create applicant's claimed catalyst combination would be obvious to one having ordinary skill in the art. Applicant also asserts the novelty of a catalyst combination comprising two Group VI and one Group VIII component. This, however, is also an inaccurate assertion because Velenyi discloses that two or more of the Group VIII and Group VI metal components may be combined in its disclosed catalyst. See Abstract. Finally, applicant asserts that his catalyst combination results in unexpectedly high activity. Applicant,

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however, fails to particularly point out in his response how the combination of Ni, Mo, and W results in unexpectedly high activity. Therefore, the Examiner maintains that the teachings in the Sawyer and Velenyi references would suggest to one of ordinary skill in the art the process as claimed by applicant.

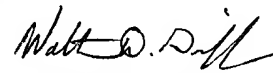
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James Arnold, Jr. whose telephone number is 703-305-5308. The examiner can normally be reached on Monday-Thursday 8:30 AM-6:00 PM; Fridays from 8:30 AM-5:00 PM with alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 703-308-6824. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0651.

ja
June 5, 2003


Walter D. Griffin
Primary Examiner